CIVIL-TECH CONSULTANTS AND ENGINEERS

Building & Highway Material Testing Laboratory

NABL - Accredited Laboratory as per ISO / IEC-17025 :2005

T-2377

Job No.: CTCE/BBMP/W.No.07/NVP/CSR-8/918a/CEMENT/2015-16 Date: 12.08.2015

TEST REPORT ON CEMENT

* CUSTOMER	:	**Asst. Executive Engineer**, Byatarayanapura Sub Division, BBMP, Bangalore.
*AGENCY	:	**Mr. Ninganagowda V Patil,** No.57/7, Sri. Krishna Nilaya, 2nd Main Road, Ganganagara Layout, Ganganagara, R.T. Nagara Post, Bangalore - 560032.
*NAME OF THE WORK	:	Improvements to roads and drains in Amruthanagara 'C' Sector cross roads in Ward No.07 Byatarayanapura, Kodigehalli Sub Division, BBMP, Bangalore.
*REFERENCE	:	AEE/B.T.P.SUB.DIV)/19/A/ /2015-16 Dated: 10.08.2015
SAMPLE ID	:	Cement
SAMPLE RECEIVED ON	:	10.08.2015
PERIOD OF TESTING	:	10.08.2015 to 12.08.2015

The results of the tests conducted on the cement sample are as follows:

AE-7

Sl. No	Descriptions	Test Method as per IS	Test Result	Requirements as per IS: 8112-2013
1	Standard Consistency	IS-4031 (Part -4) 1988(RA-2009)	30.00 %	-
2	a) Initial Setting Time	IS-4031 (Part -5) 1988(RA-2009)	155 Minutes	Not Less than 30 Minutes
	b) Final Setting Time	IS-4031 (Part -5) 1988(RA-2009)	490 Minutes	Not More than 600 Minutes
3	Soundness by Le Chartlier Method	IS-4031 (Part-3) 1988(RA-2009)	1 mm	Not more than 10mm

*Information is furnished by the Customer/Representative.

Assistant Executive Engineer
Kodigehalli Sub Division
Yelahanka Zone, B.B.M.P.
Bangalore.

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VISHWANATH. I.A.
Chief Executive Officer

#23/14, 7th Cross, 3rd Stage, 4th Block, Shakthi Ganapathi Nagara, Basaveshwaranagar, Bangalore-79.
Tele Fax : 23223227, Website : www.civiltechconsultants.com
E-mail : vishwanath.ia@civiltechconsultants.com / info@civiltechconsultants.com

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T-2377

Job No.: CTCE/BBMP/W.No.07/NVP/CSR-8/918a/SAND-Gradation/2015-16 : 12.08.2015

TEST REPORT ON DETERMINATION GRADATION OF FINE AGGREGATES

* Customer : **Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.

* Agency : **Mr. Ninganagowda V Patil,**
No.57/7, Sri. Krishna Nilaya, 2nd Main Road, Ganganagara Layout, Ganganagara, R.T. Nagara Post, Bangalore - 560032.

* Name of Work : Improvements to roads and drains in Amruthanagara 'C' Sector cross roads in Ward No.07 Byatarayanapura, Kodigehalli Sub Division, BBMP, Bangalore.

Reference : AEE/B.T.P.SUB.DIV)/19/A/ /2015-16 Dated: 10.08.2015

Technical Reference : IS : 2386 Part 1 - 1963 RA-2007

Sample ID : Fine Aggregates

Sample Received on : 10.08.2015

Date of Testing : 12.08.2015

Total Wt. of Aggregates in gms **1000**

AE-7

Assistant Executive Engineer, Kodigehalli Sub Division, Yelahanka Zone, B.B.M.P, Bangalore.

Is Sieve Size in mm	Cumulative Weight Passing in %	Specific Limits as per IS 383-1970 (RA- 2007)			
		Zone-I	Zone-II	Zone-III	Zone-IV
10	100	100	100	100	100
4.75	94.80	90-100	90-100	90-100	95-100
2.36	76.80	60-95	75-100	85-100	95-100
1.18	57.00	30-70	55-90	75-100	90-100
600 Micron	28.50	15-34	35-59	60-79	80-100
300 Micron	16.30	5-20	8-30	12-40	15-50
150 Micron	6.10	0-10	0-10	0-10	0-15

* Information is furnished by the Customer/Representative

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Remarks : This sample is under Zone-I specific limits.

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E-mail : vishwanath.ia@civiltechconsultants.com / info@civiltechconsultants.com

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T-2377

Job No.: CTCE/BBMP/W.No.07/NVP/CSR-8/918a/AGG/GR/2015-16 : 12.08.2015

TEST REPORT ON DETERMINATION GRADATION OF COARSE AGGREGATES

* Customer	: **Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
* Agency	: **Mr. Ninganagowda V Patil,** No.57/7, Sri. Krishna Nilaya, 2nd Main Road, Ganganagara Layout, Ganganagara, R.T. Nagara Post, Bangalore - 560032.
* Name of Work	: Improvements to roads and drains in Amruthanagara 'C' Sector cross roads in Ward No.07 Byatarayanapura, Kodigehalli Sub Division, BBMP, Bangalore.
Reference	: AEE/B.T.P.SUB.DIV)/19/A/ /2015-16 Dated: 10.08.2015
Technical Reference	: IS : 2386 Part 1 -1963 RA-2007
Sample ID	: Coarse Aggregates (40mm)
Sample Received on	: 10.08.2015
Date of Testing	: 12.08.2015

AE-7

Assistant Executive Engineer, Kodigehalli Sub Division, Yelahanka Zone, B.B.M.P, Bangalore.

Total Wt. of Aggregates in gms= **10000**

Is Sieve Size in mm	Cumulative Weight Passing in %	Specific Limits as per IS 383-1970 (RA- 2007)	
		Graded	Single Sized
80	100	100	-
63	100	-	100
40	96.50	95-100	85-100
20	34.00	30-70	0-20
10	11.05	10-35	0-5
4.75	1.55	0-5	-

* Information is furnished by the Customer/Representative

Civil-Tech Consultants & Engineers Bangalore

Remarks : This sample is under Graded specific limits.

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E-mail : vishwanath.ia@civiltechconsultants.com / info@civiltechconsultants.com

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JAS-ANZ BSCIC ISO 9001 REGISTERED

Job No.: CTCE/BBMP/W.No.07/NVP/STEEL/2015-16 17.08.2015

TEST REPORT ON REINFORCEMENT STEEL

Customer	:	**Asst. Executive Engineer**, Byatarayanapura Sub Division, BBMP, Bangalore.
Agency	:	**Mr. Ninganagowda V Patil,** No.57/7, Sri. Krishna Nilaya, 2nd Main Road, Ganganagara Layout, Ganganagara, R.T. Nagara Post, Bangalore - 560032.
Name of the work	:	Improvements to roads and drains in Amruthanagara 'C' Sector cross roads in Ward No.07 Byatarayanapura, Kodigehalli Sub Division, BBMP, Bangalore.
Reference	:	AEE/B.T.P.SUB.DIV)/19/A/ /2015-16 Dated: 10.08.2015
Date of Test	:	17.08.2015
Technical Reference	:	IS: 1786-2008

AE-7

Assistant Executive Engineer
Kodigehalli Sub Division
Yelahanka
Bangalore

Sl. No	Nominal size (dia) (mm)	Mass per metre (Kg/mtr)	TENSILE STRENGTH			Bend Test	Rebend Test
			0.20% proof stress/Yield stress N/mm²	Tensile strength (Ultimate stress) N/mm²	Elongation percent gauge length		
1	12	0.89	515	558	13.25	O.K	O.K

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#23/14, 7th Cross, 3rd Stage, 4th Block, Shakthi Ganapathi Nagara, Basaveshwaranagar, Bangalore-79.

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E-mail : vishwanath.ia@civiltechconsultants.com / info@civiltechconsultants.com

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Job No.: CTCE/BBMP/W.No.07/NVP/STEEL/2015-16 17.08.2015

TEST REPORT ON REINFORCEMENT STEEL

Customer	:	**Asst. Executive Engineer**, Byatarayanapura Sub Division, BBMP, Bangalore.
Agency	:	**Mr. Ninganagowda V Patil,** No.57/7, Sri. Krishna Nilaya, 2nd Main Road, Ganganagara Layout, Ganganagara, R.T. Nagara Post, Bangalore - 560032.
Name of the work	:	Improvements to roads and drains in Amruthanagara 'C' Sector cross roads in Ward No.07 Byatarayanapura, Kodigehalli Sub Division, BBMP, Bangalore.
Reference	:	AEE/B.T.P.SUB.DIV)/19/A/ /2015-16 Dated: 10.08.2015
Date of Test	:	17.08.2015
Technical Reference	:	IS: 1786-2008

AE-7

Assistant Executive Engineer
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P
Bangalore

Sl. No	Nominal size (dia) (mm)	Mass per metre (Kg/mtr)	TENSILE STRENGTH			Bend Test	Rebend Test
			0.20% proof stress/Yield stress N/mm²	Tensile strength (Ultimate stress) N/mm²	Elongation percent gauge length		
1	16	1.58	520	563	13.50	O.K	O.K

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E-mail : vishwanath.ia@civiltechconsultants.com / info@civiltechconsultants.com

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T-2377

Job No.: CTCE/BBMP/W.No.07/NVP/CSR-8/918a/CUBE/2015-16 24.09.2015

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

* Customer	: **Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
* Agency	: **Mr. Ninganagowda V Patil,** No.57/7, Sri. Krishna Nilaya, 2nd Main Road, Ganganagara Layout, Ganganagara, R.T. Nagara Post, Bangalore - 560032.
* Name of the work	: Improvements to roads and drains in Amruthanagara 'C' Sector cross roads in Ward No.07 Byatarayanapura, Kodigehalli Sub Division, BBMP, Bangalore.
* Reference	: AEE/B.T.P.SUB.DIV)/19/A/ /2015-16 Dated: 10.08.2015
* Sample ID	: Culvert Deck Slab Concrete
Size of cubes	: 150mmx150mmx150mm
Cross Sectional Area	: 22500 mm^2
Technical Reference	: IS: 516-1959 (Reaffirmed 2008)
* Grade of Concrete	: M_{20}
Compressive Strength as on	: 28th day
Sample Received on	: 27.08.2015

AE-7

Assistant Executive Engineer
Kodigehalli Sub Division
Yelahanka ... B.B.M.P.
Bangalore

Sl.No.	* Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	27.08.2015	24.09.2015	8.198	475.5	21.13
2	27.08.2015	24.09.2015	8.285	503.2	22.36
3	27.08.2015	24.09.2015	8.360	525.3	23.35

* Information is furnished by the Customer/Representative

Civil Tech Consultants & Engineers Bangalore

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Job No.: CTCE/BBMP/W.No.07/NVP/WMM/Gradation/2015-16 09.09.2015

GRADATION FOR WMM
MORTH TABLE-400-11

Customer : **Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.

Agency : **Mr. Ninganagowda V Patil,**
No.57/7, Sri. Krishna Nilaya, 2nd Main Road, Ganganagara Layout, Ganganagara, R.T. Nagara Post, Bangalore - 560032.

Name of Work : Improvements to roads and drains in Amruthanagara 'C' Sector cross roads in Ward No.07 Byatarayanapura, Kodigehalli Sub Division, BBMP, Bangalore.

Reference : AEE/B.T.P.SUB.DIV)/19/A/ /2015-16 Dated: 10.08.2015

Date of Testing : 09.09.2015

Material : WMM

Sample Location : WMM Mix Plant Oven Dry Wt (gm): 7390

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	145	145	2.0	98.0	95-100
22.4	2350	2495	33.8	66.2	60-80
11.2	1210	3705	50.1	49.9	40-60
4.75	1205	4910	66.4	33.6	25-40
2.36	900	5810	78.6	21.4	15-30
0.600	690	6500	88.0	12.0	8-22
0.075	625	7125	96.4	3.6	0-8

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Job No.: CTCE/BBMP/W.No.07/NVP/WMM/AIV/2015-16 09.09.2015

Aggregate Impact Value

IS: 2386 Part IV

Customer	**Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
Agency	**Mr. Ninganagowda V Patil,** No.57/7, Sri. Krishna Nilaya, 2nd Main Road, Ganganagara Layout, Ganganagara, R.T. Nagara Post, Bangalore - 560032.
Name of the Work	Improvements to roads and drains in Amruthanagara 'C' Sector cross roads in Ward No.07 Byatarayanapura, Kodigehalli Sub Division, BBMP, Bangalore.
Reference	AEE/B.T.P.SUB.DIV)/19/A/ /2015-16 Dated: 10.08.2015
Source / Location	WMM Plant
Type of Mix	Wet Mix macadam
Date of Testing	09.09.2015

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	386	388	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	86	87	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	300	301	
4	Aggregate Impact value = percent fines	22.28	22.42	
	100* (W_2/W_1)%			22.35

AE-7

Assistant Executive Engineer
Kodigehalli Sub Division
Yelahanka

Comments:

→ Maximum allowable Aggregate Impact value for Wet mix Macadam is 30%

Note:

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Job No.: CTCE/BBMP/W.No.07/NVP/WMM/S-T/2015-16 09.09.2015

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Customer	**Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
Agency	**Mr. Ninganagowda V Patil,** No.57/7, Sri. Krishna Nilaya, 2nd Main Road, Ganganagara Layout, Ganganagara, R.T. Nagara Post, Bangalore - 560032.
Name of Work	Improvements to roads and drains in Amruthanagara 'C' Sector cross roads in Ward No.07 Byatarayanapura, Kodigehalli Sub Division, BBMP, Bangalore.
Reference	AEE/B.T.P.SUB.DIV)/19/A/ /2015-16 Dated: 10.08.2015
Technical Reference	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Wet Mix Macadam
Date of Testing	09.09.2015

AE-7

Result : Flakiness Index = **12.32%**

Elongation Index = **13.96%**

Result : Combined Flakiness & Elongation index 26.28%

Assistant Executive Engineer Kodigehalli Sub Division BBMP

Comments:

Maximum allowable Flakiness & Elongation Index for Wet Mix Macadam is 30%

Note:

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Job No.: CTCE/BBMP/W.No.07/NVP/CSR-8/918a/QB(SDBC)/2015-16 18.09.2015

TEST REPORT ON DETERMINATION OF BITUMEN CHARACTERISTICS

*CUSTOMER	:	**Asst. Executive Engineer**, Byatarayanapura Sub Division, BBMP, Bangalore.
*AGENCY	:	**Mr. Ninganagowda V Patil,** No.57/7, Sri. Krishna Nilaya, 2nd Main Road, Ganganagara Layout, Ganganagara, R.T. Nagara Post, Bangalore - 560032.
*NAME OF THE WORK	:	Improvements to roads and drains in Amruthanagara 'C' Sector cross roads in Ward No.07 Byatarayanapura, Kodigehalli Sub Division, BBMP, Bangalore.
REFERENCE	:	AEE/B.T.P.SUB.DIV)/19/A/ /2015-16 Dated: 10.08.2015
*SAMPLE ID	:	Bitumen
DATE OF SAMPLING	:	16.09.2015
DATE OF TESTING	:	18.09.2015

AE-7

The results of the tests conducted on the bitumen sample.

Sl. No	Description	Test Method as per IS	Test Result	Requirement as per IS:73:2013
1	Penetration at 25 ^{0}C, 1/10 mm	IS :1203 -1978 (RA-2009)	82	80 to 100
2	Softening point, ^{0}C	IS :1205 -1978 (RA-2009)	46	Min. 40
3	Ductility at 27^{0}C, cm	IS :1208 -1978 (RA-2009)	100 >	Min. 75
4	Flash Point, ^{0}C	IS :1209 -1978 (RA-2009)	298	Min. 220

Assistant Executive Engineer
Kodigehalli Sub Division
Yelahanka Zone, B.B.M.P.

*Information is furnished by the Customer/Representative.

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Job No.: CTCE/BBMP/W.No.07/NVP/SDBC/Bitumen/2015-16 25.09.2015

BITUMEN CONTENT DETERMINATION OF SEMI DENSE BITUMINOUS CONCRETE MIX

As per IRC:SP:11-1984

CUSTOMER	**Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
AGENCY	**Mr. Ninganagowda V Patil,** No.57/7, Sri. Krishna Nilaya, 2nd Main Road, Ganganagara Layout, Ganganagara, R.T. Nagara Post, Bangalore - 560032.
NAME OF THE WORK	Improvements to roads and drains in Amruthanagara 'C' Sector cross roads in Ward No.07 Byatarayanapura, Kodigehalli Sub Division, BBMP, Bangalore.
REFERENCE	AEE/B.T.P.SUB.DIV)/19/A/ /2015-16 Dated: 10.08.2015
SAMPLE I/D	Cross roads in Amruthanagara 'C' Sector in Ward No.07, BBMP, Bangalore.
DATE OF TESTING	25.09.2015

BITUMEN CONTENT DETERMINATION

Description	Trail 1	Trail 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	475	474
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	25	26.00
7. Bitumen content in %	5.00	5.20
8. Average	**5.10**	

Note:

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- The results indicated above are based on the tests carried out on the samples collected on work site.
- Any Query regarding the report must be reported within 30 days from the date of testing.

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JAS-ANZ BSCIC ISO 9001 REGISTERED

Job No.: CTCE/BBMP/W.No.07/NVP/SDBC/Bitumen/2015-16 25.09.2015

GRADATION DETERMINATION OF SEMI DENSE BITUMINOUS CONCRETE MIX

As per IS2386 and IRC:SP:11-1984

CUSTOMER	**Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
AGENCY	**Mr. Ninganagowda V Patil,** No.57/7, Sri. Krishna Nilaya, 2nd Main Road, Ganganagara Layout, Ganganagara, R.T. Nagara Post, Bangalore - 560032.
NAME OF THE WORK	Improvements to roads and drains in Amruthanagara 'C' Sector cross roads in Ward No.07 Byatarayanapura, Kodigehalli Sub Division, BBMP, Bangalore.
REFERENCE	AEE/B.T.P.SUB.DIV)/19/A/ /2015-16 Dated: 10.08.2015
SAMPLE I/D	Cross roads in Amruthanagara 'C' Sector in Ward No.07, BBMP, Bangalore
DATE OF TESTING	25.09.2015

GRADATION AFTER EXTRACTION

Sieve Size in mm	Trail 1				Specified Limits as per MORTH specification table 500-15 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
13.2	0	0	0	100	100
9.5	36.23	7.63	7.63	92.37	90-100
4.75	260.5	54.84	62.47	37.53	35-51
2.36	44.65	9.40	71.87	28.13	24-39
1.18	35.26	7.42	79.29	20.71	15-30
0.3	32.65	6.87	86.17	13.83	9-19
0.075	39.65	8.35	94.51	5.49	3-8

AE-I

Assistant Executive Engineer, Kodigehalli Sub Division, Yelahanka

Sieve Size in mm	Trail 2				Specified Limits as per MORTH specification table 500-15 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
13.2	0	0	0	100	100
9.5	38.52	8.13	8.13	91.87	90-100
4.75	260.5	54.96	63.08	36.92	35-51
2.36	52.32	11.04	74.12	25.88	24-39
1.18	39.65	8.36	82.49	17.51	15-30
0.3	32.56	6.87	89.36	10.64	9-19
0.075	28.56	6.03	95.38	4.62	3-8

Note:

- This test report should not be reproduced except in full, without written approval of the laboratory.
- The results indicated above are based on the tests carried out on the samples received in the laboratory.
- Any Query regarding the report must be reported within 30 days from the date of testing.

Civil-Tech Consultants & Engineers Bangalore

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VISHWANATH. I.A.
Chief Executive Officer

#23/14, 7th Cross, 3rd Stage, 4th Block, Shakthi Ganapathi Nagara, Basaveshwaranagar, Bangalore-79.

Tele Fax : 23223227, Website : www.civiltechconsultants.com

E-mail : vishwanath.ia@civiltechconsultants.com / info@civiltechconsultants.com